REMARKS

Claims 1-10 have been provisionally rejected under the judicially created doctrine of obviousness double patenting over Application No. 11/293,568 – A two way test must be applied to this application [see MPEP 804(II)B.1(b)], because the present application is earlier filed, the administrative delay was the fault of the Patent Office, and this later filed application could not have been filed at the same time as the present application because the invention had not yet been made. It is pointed out that the '568 application would not be obvious in view of the present application, because an important limitation in the claims of the '568 application is that the microwave susceptor must have a Curie point of about 100°C to about 300°C. Although the present application covers susceptors that could have a Curie point as specified in '568, it does not point out or otherwise discuss or disclose the advantage of using a susceptor with the Curie point temperatures mentioned in '568. Therefore '568 is not obvious over the present application, and this rejection is overcome. It is respectfully requested that this basis for rejection be withdrawn.

Note – Applicant is somewhat surprised by this rejection since it was applied in the office action of Nov. 8, 2006, but not in the office action of May 18, 2007, and Applicant believed he had overcome this rejection. The response above is verbatim from the response to the office action of Nov. 8, 2006.

In the responses to the rejections based on art below, certain references are referred to and they are summarized below:

<u>Reference A</u> – R.C. Progelhof et al., *Polym. Eng. Sci.*, vol. 16, p. 615-625 (1976) summarizes known methods of calculating thermal conductivities of polymer compositions. It illustrates the difficulty of such calculations.

<u>Reference B</u> – I.L. Erukhimovich, et al., *AIChE Journal*, vol. 37, p. 1739-1743(1991) also describes methods of calculating thermal conductivity of heterogeneous systems, including polymer compositions. It emphasizes that the form (single particles, aggregates, etc.) assumed by the filler(s) is important in determining what the actual thermal conductivity will be.

<u>Reference C</u> – J.A. Heiser, et al., *Polym. Comp.*, vol. 25, p. 186-193(2004) describes the preparation of compositions containing nylon-6,6 and carbon in various forms. It states (p. 186 left hand column) that polymers have a thermal conductivity of 0.2-0.3 W/mK. It also shows that in nylon-6,6 a volume fraction of carbon black of

at least about 0.2 (20% by volume, about 28% by weight) is needed to obtain a thermal conductivity of about 0.7 W/mK (p. 191). It also shows on p. 191 that different forms of carbon give differing thermal conductivities.

Reference D – C.L. Choy, et al., *J. Polym. Sci., B: Polym Physics*, vol. 33, p. 2055-2064(1995) describes the thermal conductivity of LCPs. Figure 2 shows that both Vectra® A950, a polyester, and Vectra® B950 (a polyesteramide) have approximately the same transverse thermal conductivity, about 0.2 W/mK.

Reference E – J.A. King, et al., *J. Appl. Polym. Sci.*, vol. 99, p. 1552-1558(2006) describes carbon filled LCP compositions. It too shows that the form of the carbon filler is important in the thermal conductivity that is obtained (Fig. 4). Figure 4 also shows that higher thermal conductivities are not reached until volume fractions higher than 0.3 are reached.

Reference F – J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 102, p. 5456-5462(2006) describes carbon fiber containing LCP compositions. It has convenient Tables IV and V which convert volume percent to weight percent carbon fiber. It is interesting to note that 30 volume percent is about 35 weight percent fiber, and that Tables V and VI show that it requires about 45-55 weight percent of these fibers to obtain a through plane thermal conductivity of about 0.7 W/mK.

Reference G – J.M. Kieth, et al., *J. Appl. Polym. Sci.*, vol. 105, p. 3309-3316(2007) describes carbon (various forms) containing LCP compositions. It too has a table (Table VI) which converts volume percent filler to weight percent. It too shows that the weight fraction of carbon needed in the composition to achieve a thermal conductivity of at least about 0.7 W/mK is about 40 weight percent or more.

Claims 1-10 have been rejected under 35 U.S.C. 102(b) as anticipated by, or in the alternative under 35 U.S.C. 103(b) as obvious over WO01/34702A2 (herein WO). Applicant traverses for the following reasons.

Enclosed herewith is a Declaration under 37 C.F.R. 1.132 by Dr. Joel Citron which describes an experiment he directed and conclusions that he reached. These conclusions are based on that experiment, certain references cited in the Declaration, and Dr. Citron's experience in the field. The Declaration clearly shows that the maximum 10 percent carbon filler that is described in WO is clearly too little to produce the presently desired thermal conductivity of 0.7 W/mK. Therefore WO cannot anticipate the present claims.

Furthermore it is noted that WO gives no incentive to make a composition which has the requisite minimum thermal conductivity, since it does not mention higher thermal conductivity as a desirable property, nor does it otherwise recommend using thermally conductive fillers in relatively large amounts, amounts that would give the requisite thermal conductivity. It merely states that 10% carbon fiber is enough. References C, E, F and G clearly show that much more carbon fiber than 10 weight percent would be required to attain a thermal conductivity of 0.7 W/mK. Therefore WO does not render these claims obvious.

Claims 1-10 have been rejected under 35 U.S.C. 102(b) as anticipated, or in the alternative under 35 U.S.C. 103(a) as obvious over U.S. Patent 5,028,461 (Nakamichi).

In regards to the actual amount of "inorganic filler" (including carbon black or carbon fiber) which may be present in the compositions two passages in Nakamichi are pertinent, column 2, lines 36-37, and col. 3, line 67 to col. 4 line 1. It states that the glass fiber or glass fiber plus filler (when present) is 20 to 70 weight percent of the composition. This means that the polymeric component (the only other component) is 80 to 30 weight percent of the composition. Using these parameters one can calculate what the proportions of the various ingredients are in the composition at any given composition within these limits. Some of these proportions are shown in Table 1.

Table 1

% Filler of Glass	Wt % Glass+Filler	Weight polymer	Weight Glass	Weight Filler	% Filler
90	70	30	36.8	33.2	33.2
10	70	30	63.6	6.4	6.4
90	20	80	10.5	9.5	9.5
10	20	80	18.2	1.8	1.8

The first and last rows of Table represent the extremes of the concentrations of the inorganic filler. (Applicant regrets reporting the previous calculations which did not take into account that the total of the glass plus inorganic filler was 20 to 70 weight

percent of the composition.) The Examiner is invited to test these values for himself. Thus the range of inorganic (carbon) filler concentrations is 1.8 to 33.2% by weight.

As noted above in the Declaration for the response to the rejection under WO, and in References C, D, E, F and G, 10% of carbon black is insufficient to raise the thermal conductivity of organic polymers, to the desired 0.7 W/mK, and depending upon the particular type of carbon filler chosen, this may range (according to these references) from about 28 to greater than 50 weight percent carbon.

Applicant repeats his assertion that the passage at col. 3, lines 51-56 would taken by the art skilled as a recitation or laundry list of inorganic fillers in general and the specific fillers listed are simply "examples" of such fillers, as stated on line 56. In order to obtain a composition as claimed by the Applicant, one would have to choose a thermally conductive filler, say carbon black or carbon fiber, and put a sufficient amount of it into the polymeric material to raise its thermal conductivity to at least about 0.7 W/mK.

Nothing within Nakamichi hints at doing this, either choosing a filler with a desirable thermal conductivity or putting enough of it in to reach a certain minimum thermal conductivity. Put another way Nakamichi does not disclose the present invention since "Rejection for anticipation requires, as first step, that all elements of claimed invention be described in single reference, and such reference must describe applicant's claimed invention sufficiently to have placed person of ordinary skill in possession of it." *In re Spada*, (CAFC 1990) 15 USPQ2d 1655, and this specificity is simply not present in Nakamichi.

As for obviousness, as noted above Nakamichi does not hint at the desirability of using a high thermal conductivity filler nor does he mention the fact that it is desirable for the resulting polymeric composition to have a high thermal conductivity. Indeed one would have to select these "properties", that use of a filler in a sufficient amount to obtain a thermal conductivity of 0.7 W/mK, from a wide variety of possibilities within Nakamichi, to obtain Applicant's invention. Furthermore, specifically for carbon, at best with certain types of carbon fillers, it would require the amount of carbon to be at the upper end of Nakamichi filler concentration range (see the Declaration). Therefore these claims are not obvious over Nakamichi.

Comments on "Response to Arguments"

The Applicant thanks the Examiner for his extensive response.

In regard to the arguments concerning thermal conductivity and particular form of the filler the Applicant was NOT trying to argue that these were properties necessary to mention in the claims. Rather the Examiner pointed out that in the Specification it stated that the amount of thermally conductive filler typically used would be 5 to 65 weight percent, and that this was inherently met by Nakamichi and WO. Applicant was merely trying to convey that the minimum amount of thermally conductive filler needed *for any particular filler* would depend on the properties of that filler, such as thermal conductivity, particle shape and/or size, etc. The claim is worded to state that the minimum amount of such filler required is that needed to obtained a thermal conductivity of at least about 0.7 W/mK, which is easily determined by simple experimentation. It is evident from References A, B, C, E, F and G that the properties (mentioned above) of the filler help determine the thermal conductivity of the overall composition. Indeed some of the references deal only with various carbon fillers, and clearly show differences between them, presumably based at least in part on the factors described above.

The immediately above explanation also deals with the Examiner's argument in the first paragraph on p. 5 of the office action concerning the 5 to 65% of filler typically used. Thus while a certain filler may be useful at 5 weight percent, another filler may require 40 weight percent to attain a thermal conductivity of 0.7 W/mK.

Other parts of the Examiner's response have been discussed under the response to the rejections, above.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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